

IN THE CLAIMS:

The following is a complete listing of the claims, reflects all changes currently being made thereto, and replaces all earlier versions and listings.

1. - 5. (Canceled)

6. (Previously Presented) An electron-emitting device comprising:
a cathode electrode; and
a layer connected to the cathode electrode, wherein
a plurality of groups of particles, each group being constituted by at least two particles which comprise metal as a main component and are adjacent to each other, are arranged in the layer,
the layer comprises as a main component a material which has resistivity higher than resistivity of the particles,
the adjacent two particles are arranged in a range of 5 nm or less,
and
one of the adjacent two particles is arranged to be nearer to the cathode electrode than the other particle.

7. - 46. (Canceled)

47. (New) An electron-emitting device according to claim 6, wherein
the plurality of groups of particles are arranged apart from each other by a distance equal to an average film thickness of the layer or more.

48. (New) An electron-emitting device according to claim 47, wherein a density of the particles in the layer is 1×10^{14} particles/cm³ or more and 5×10^{18} particles/cm³ or less.

49. (New) An electron-emitting device according to claim 48, wherein a concentration of a main element of the particles with respect to a main element of the layer is 0.001 atm% or more and 1.5 atm% or less.

50. (New) An electron-emitting device according to claim 47, wherein:
the layer comprises carbon as a main component; and
the particles comprises metal as a main component, and
the layer contains a hydrogen of 0.1 atm% or more and 20 atm% or less with respect to a carbon element.

51. (New) An electron-emitting device according to claim 50, wherein the metal is selected from the group consisting of Co, Ni, and Fe.

52. (New) An electron-emitting device according to claim 47, wherein graphene is included between adjacent particles among at least part of the plurality of particles.

53. (New) An electron-emitting device according to claim 48, wherein surface unevenness of the layer is smaller than 1/10 of its film thickness in rms.

54. (New) An electron-emitting device according to claim 51, wherein the layer comprising carbon as a main component has an sp^3 bonding.

55. (New) An electron-emitting device according to claim 48, wherein the particles comprise monocrystalline metal as a main component.

56. (New) An electron-emitting device according to claim 48, wherein the particles have an average particle diameter of 1 nm or more to 10 nm or less.

57. (New) An electron-emitting device according to claim 48, wherein the layer has a thickness of 100 nm or less.

58. (New) An electron-emitting device according to claim 48, wherein a density of the particles in the layer is 1×10^{15} particles / cm^3 or more and 5×10^{17} particles / cm^3 or less.

59. (New) An electron-emitting device according to claim 48, wherein a concentration of a main element of the particles with respect to a main element of the layer is 0.05 atm% or more and 1 atm% or less.

60. (New) An electron-emitting device according to claim 48, wherein the surface of the layer is terminated with hydrogen.

61. (New) An electron-emitting device according to claim 47, further comprising:

an insulating film which is arranged on the cathode electrode and has a first opening; and

a gate electrode which is arranged on the insulating film and has a second opening, wherein

the first opening and the second opening communicate with each other, and

the layer is exposed in the first opening.

62. (New) An electron source, wherein a plurality of the electron-emitting devices according to claim 47 are arranged.

63. (New) An image display apparatus, characterized by comprising the electron source according to claim 62 and a light-emitting member which emits light by being irradiated with electrons.